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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,629	11/21/2003	Derek Raybould	H0003891-1170	3479
<div><div>759005/02/2007</div><div>Honeywell International, Inc. Law Dept. AB2 P.O. Box 2245 Morristown, NJ 07962-9806</div></div>				
			EXAMINER MILLER, DANIEL H	
			ART UNIT 1775	PAPER NUMBER
			MAIL DATE 05/02/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/719,629

Applicant(s)

RAYBOULD ET AL.

Examiner

Daniel Miller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 February 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6, 8-15 and 17-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 10-15 and 17-35 is/are allowed.
- 6) ☒ Claim(s) 1-6 and 9 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-6, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (U.S. 6,733,908) in view of Stowell (US 6,207,295).
2. Regarding claims 1 Lee ('908) teaches a protective coating system used to cover a Si-based substrate in a turbine engine (column 1 line 20-30).
3. Regarding claim 1, Lee ('908) teaches a Si based substrate with an oxygen barrier layer that comprising (BSAS figure 2 and 6). The surface of the silicon substrate is SiC (diffusion barrier) or can comprise a SiN<sub>4</sub> or silicon oxynitrate (column 8 line 17-37). Regarding claim 1, the outer coating (14) can be a (YSZ) (figure 2 and abstract). However, the reference is silent as to the composition of the environmental barrier and thermal barrier layers.
4. Regarding claim 2, both diffusion barriers (the surface of the substrates) can be SiC (diffusion barrier) or comprises a SiN<sub>4</sub> or silicon oxynitride (Lee '908 column 8 line 17-37).

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5. Regarding claims 1, 3-4, the inner layer can be  $\text{SiON}_2$  and the outer layer (oxidation barrier) can be  $\text{RE}_2\text{Si}_2\text{O}_7$  where RE is Sc or Yb (column 7 line 60-68 Lee '908).

6. Regarding claim 5, Lee ('908) contemplates an oxide ceramic such as mullite, which would have  $\text{SiO}_2$  present on the surface of the substrate and render obvious a  $\text{SiO}_2$  layer (diffusion barrier) (column 8 line 30-37).

7. Regarding claims 6, Lee ('908) teaches that layer (22) comprises at least one of the disilicate mentioned above addressing claims 3-4 and a monosilicate,  $\text{ReSiO}_5$  (column 7 line 60-68), and Hafnia, a metal oxide.

8. Regarding claim 9, the outer layer is graded (see figure 6 Lee '908).

2. Stowell teaches a turbine blade with a thermal barrier coating comprising alternating outer layers of  $\text{Ta}_2\text{O}_5$  and  $\text{SiO}_2$  (claims 1-3 ref. and figures). The multilayer coating is considered to meet the limitations of applicant's claimed environmental and thermal barrier layers respectively. The layered system of Stowell can comprise many successive layers of Silica and tantalum oxide (see figure 1), meeting claim requirements for second and third layers of isolation or oxygen barrier layers.

3. The multilayered coating diffuses oxygen and prevents the formation of oxides (column 3 line 15-25).

4. It would be obvious to one of ordinary skill in the art at the time of the invention to apply the same alternating coating of Stowell to the Si-based substrate of Lee replacing the outer coating (14) of YSZ in order to diffuse oxygen and prevents the formation of oxides, which corrode the substrate.

***Allowable Subject Matter***

9. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
10. Claims 10-15, and 17-35 are allowed.

***Response to Arguments***

11. Applicant's arguments with respect to all pending claims have been considered but are moot in view of the new ground(s) of rejection. The 102 rejection in view of Lee'151 has been withdrawn due to attorney arguments. Further, the amendment to claim 1 necessitated a new rejection, see above.

***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Miller whose telephone number is (571) 272-1534. The examiner can normally be reached on M-F.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Daniel Miller



JENNIFER MCNEIL  
SUPERVISORY PATENT EXAMINER  
4/20/18